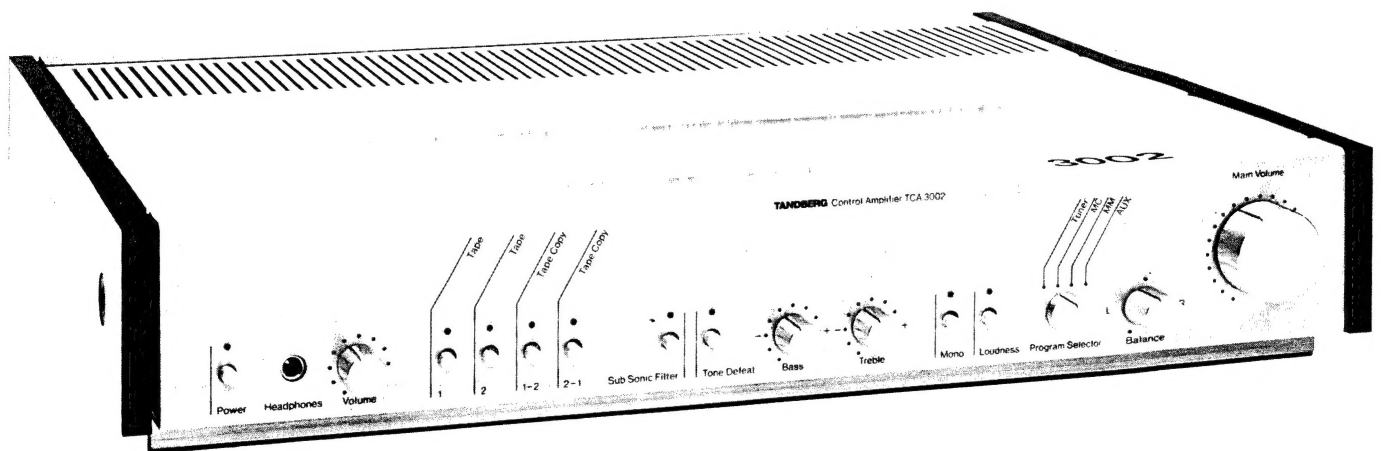


TANDBERG®

Control Amplifier 3002

Circuit Diagrams and Alignment Instructions



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Dismantling

- Top cover, rear (1).
- Top cover, front (2).
- Rear panel (3).
- Front panel (4). Remove rotary knobs.
- Bottom cover (5).

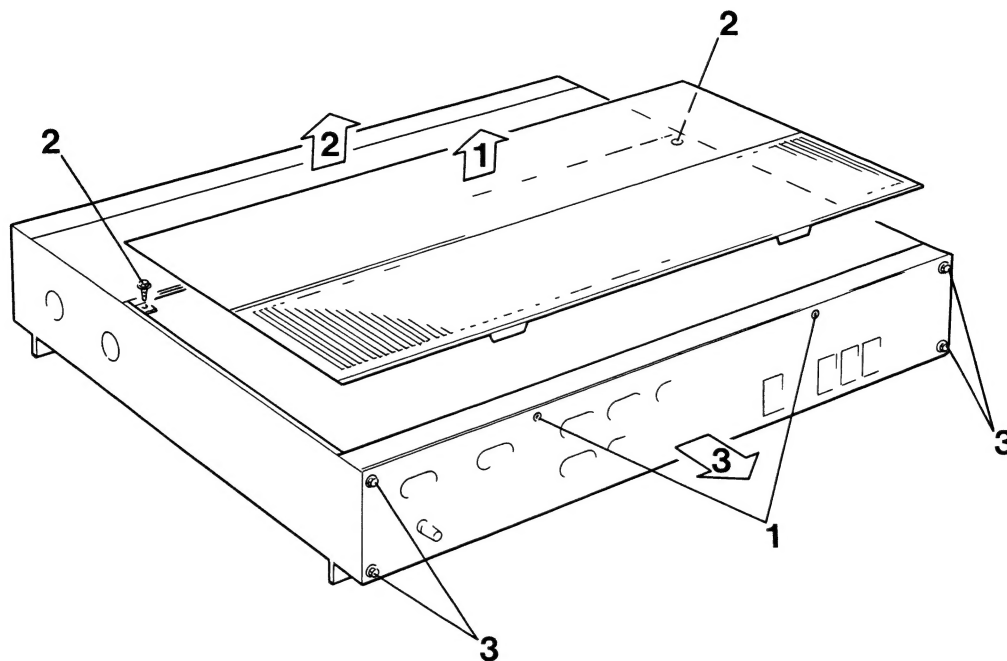


Figure 1 Dismantling the rear and top covers

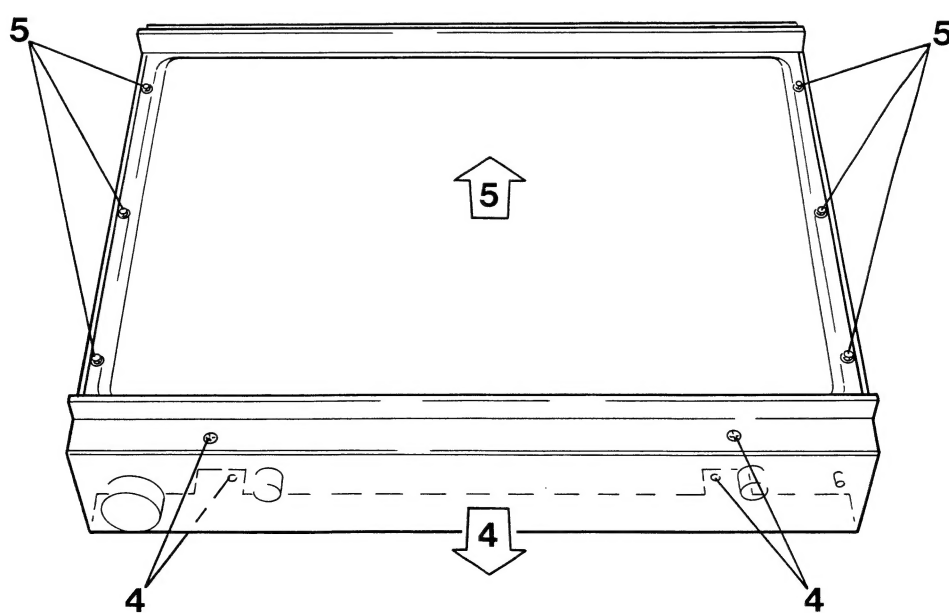


Figure 2 Dismantling the front and bottom covers

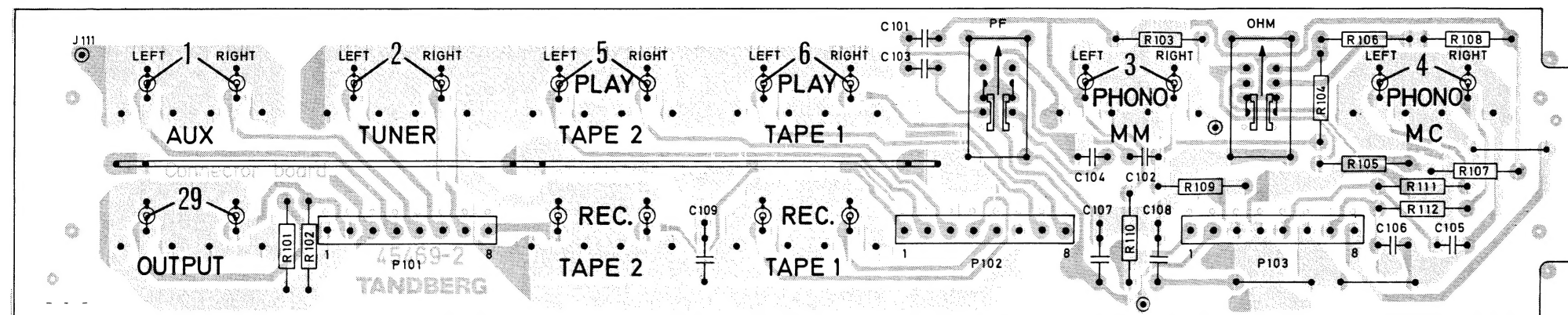


Figure 3 Connector board

ALL BOARDS ARE SEEN FROM THE SOLDER SIDE.
TEST POINTS FOR AC-VOLTAGES IN COLOUR.

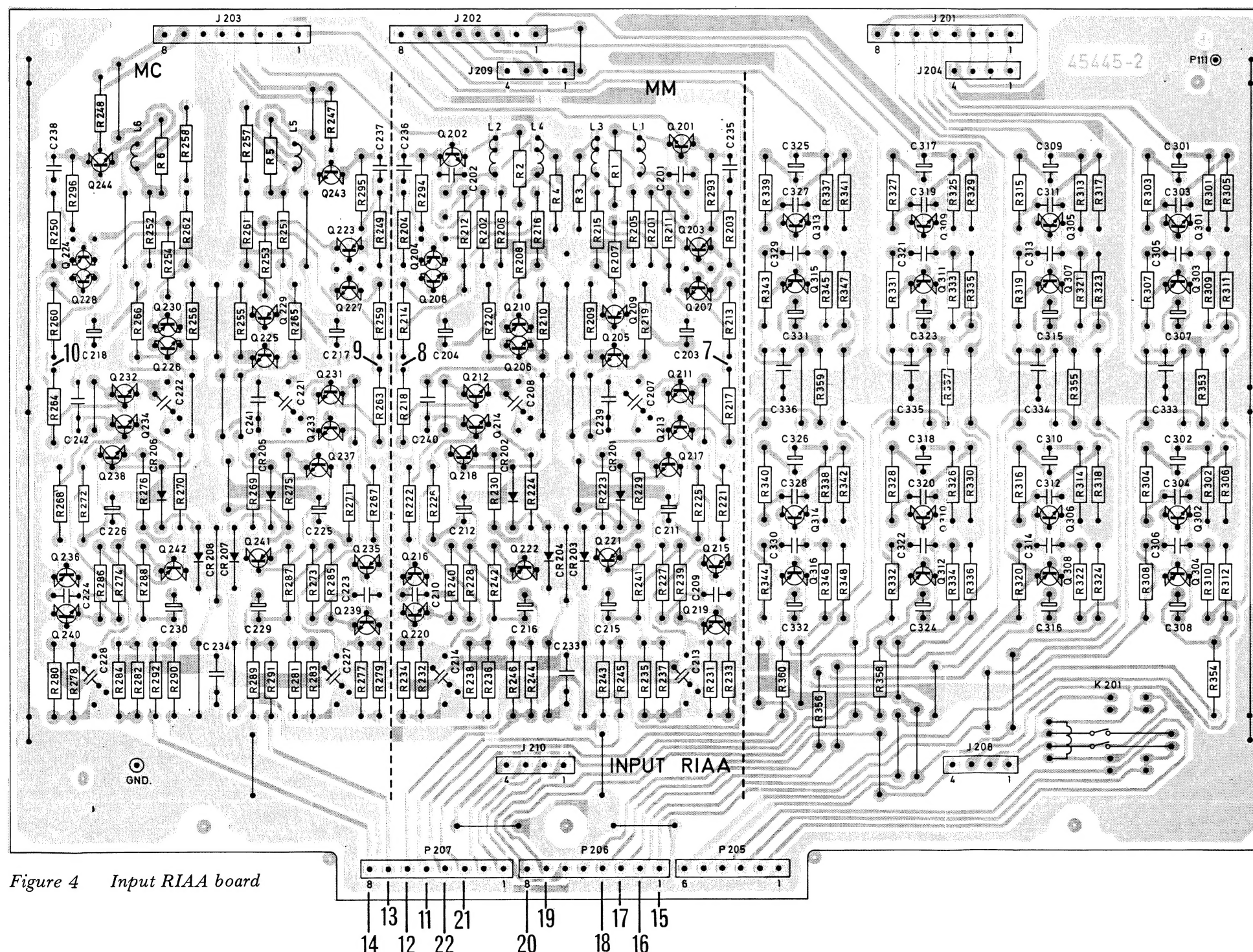


Figure 4 Input RIAA board

AC voltages

The table below gives AC voltages for the test points in Figures 3 and 4.

Test conditions

Signal: 1000 Hz.
Volume controls: Max. position.
Tone controls: Mid. position.
Balance control: Mid. position.

Test points with input signal voltages			
Test points with signal voltages	7 - 8	1 - 2 - 5 - 6 145 mV	3 2 mV
	9 - 10		16 mV
	11 - 12		145 mV
	13 - 14		16 mV
	15 - 16	145 mV (1)*	145 mV
	17 - 18	145 mV (2)*	
	19 - 20	145 mV (5)*	
	21 - 22	145 mV (6)*	
	29	1.0 V	1.0 V

* The numbers in parantheses indicate the corresponding input test points.

Test points with AC voltages are also given in the diagrams on pages 4 and 5.

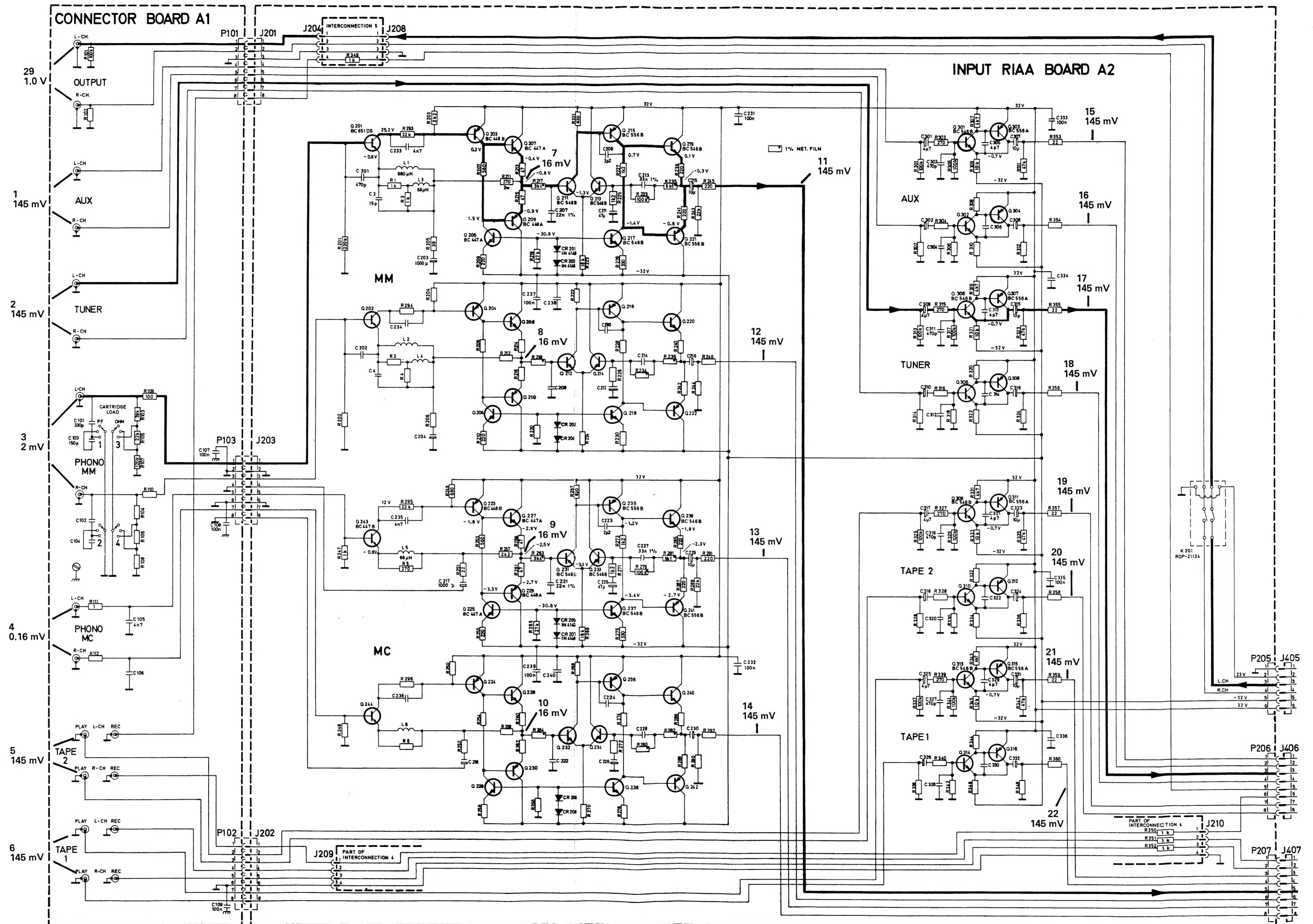


Figure 5 Circuit diagram, input amplifiers

TEST POINTS WITH AC - VOLTAGES IN COLOUR

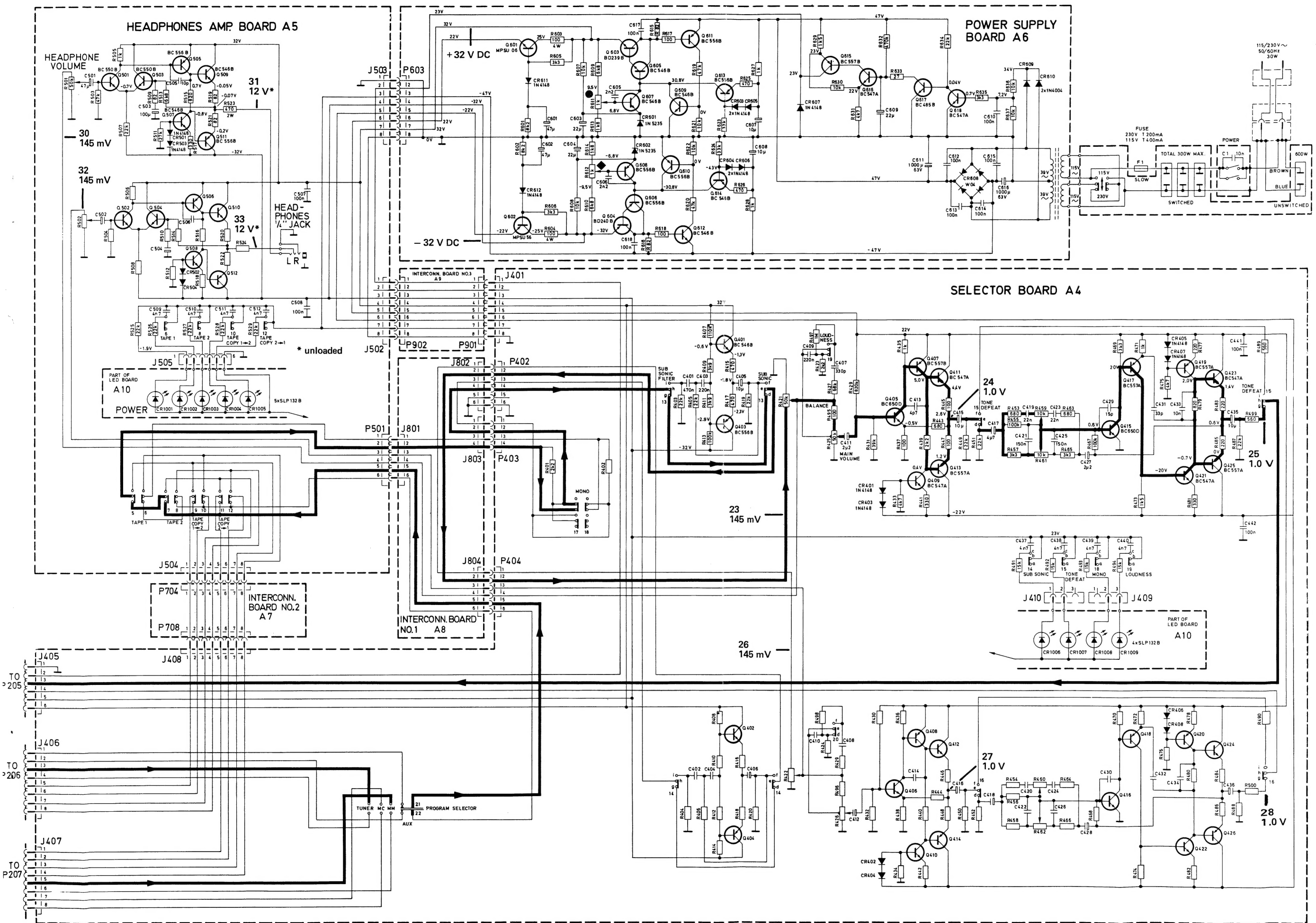


Figure 6 Circuit diagram, headphones amplifier, tone controls and power supply

TEST POINTS WITH AC - VOLTAGES IN COLOUR

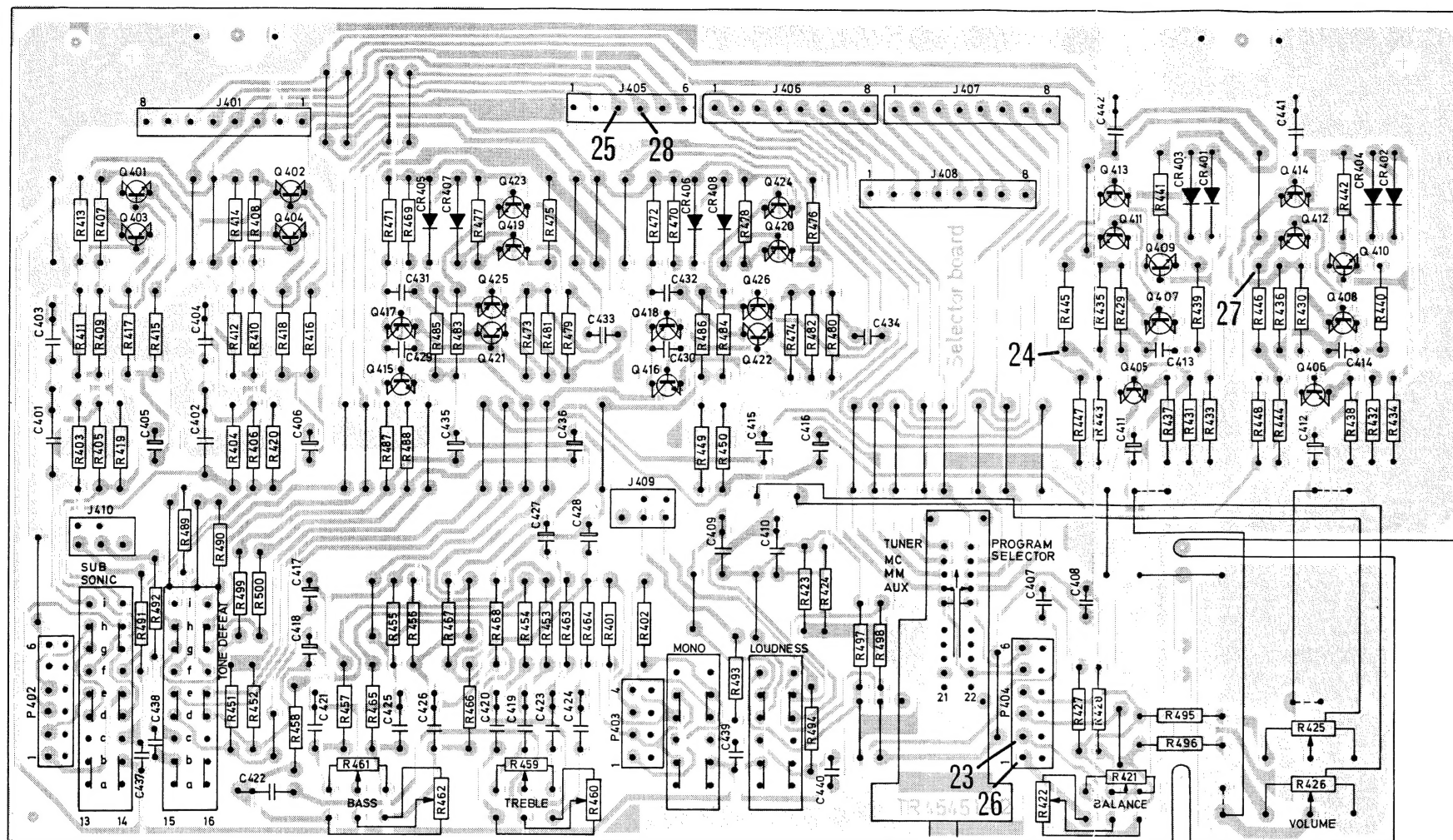


Figure 7 Selector board

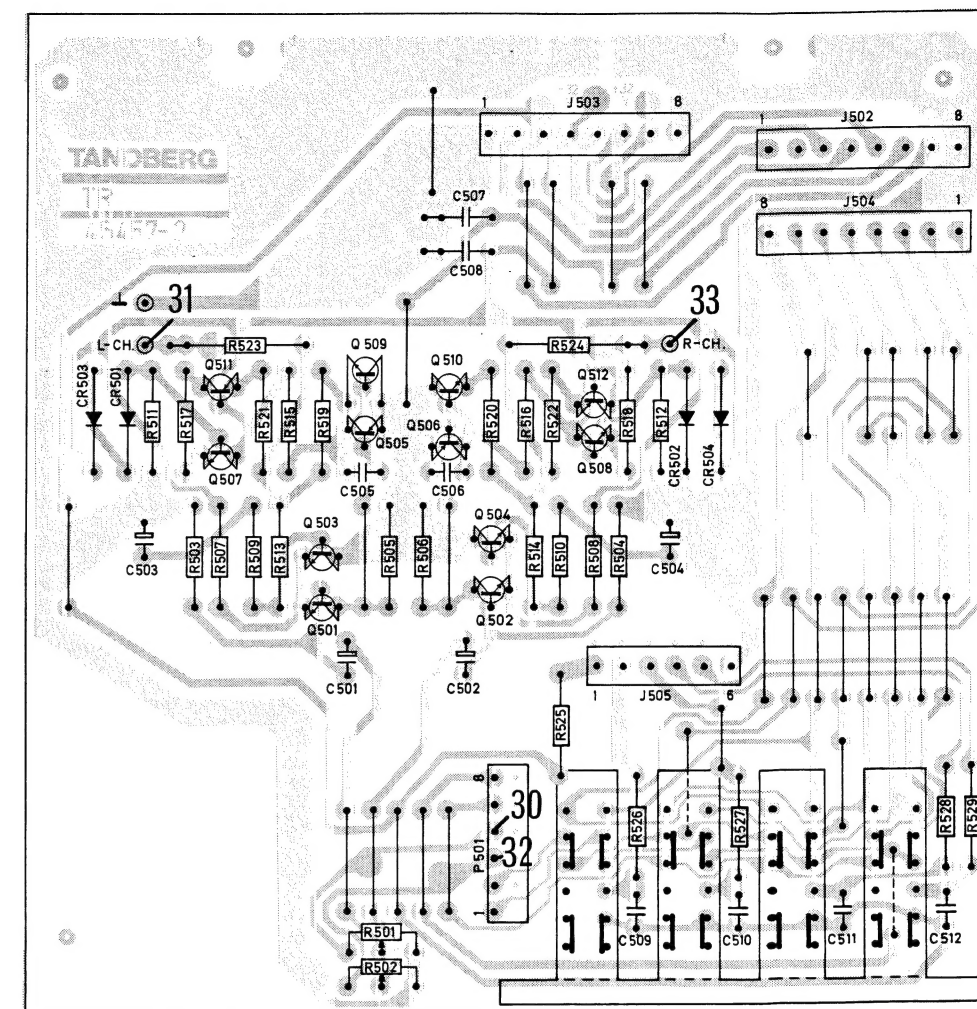


Figure 8 Headphones amplifier board

AC voltages

The table below gives AC voltages for test points in Figures 7 and 8.

		Test points with input signal voltages		
		1 – 2 – 5 – 6 145 mV	3 2 mV	4 0.16 mV
Test points with signal voltages	23	<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; border: 1px solid black; border-radius: 50%;"></div> </div>		
	24 – 25			
	26			
	27 – 28			
	30			
	31			
	32			
	33	12 V unloaded		

Test conditions

Signal: 1000 Hz.
Volume controls: Max. position.
Tone controls: Mid. position.
Balance control: Mid. position.

Test points with AC voltages are also given in the diagrams on pages 4 and 5.

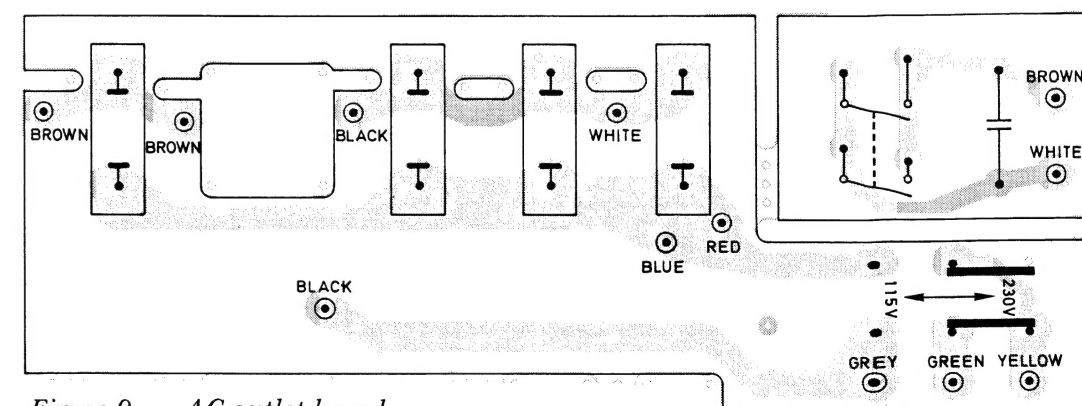


Figure 9 AC outlet board

ALL BOARDS ARE SEEN FROM THE SOLDER SIDE.
TEST POINTS FOR AC-VOLTAGES IN COLOUR.

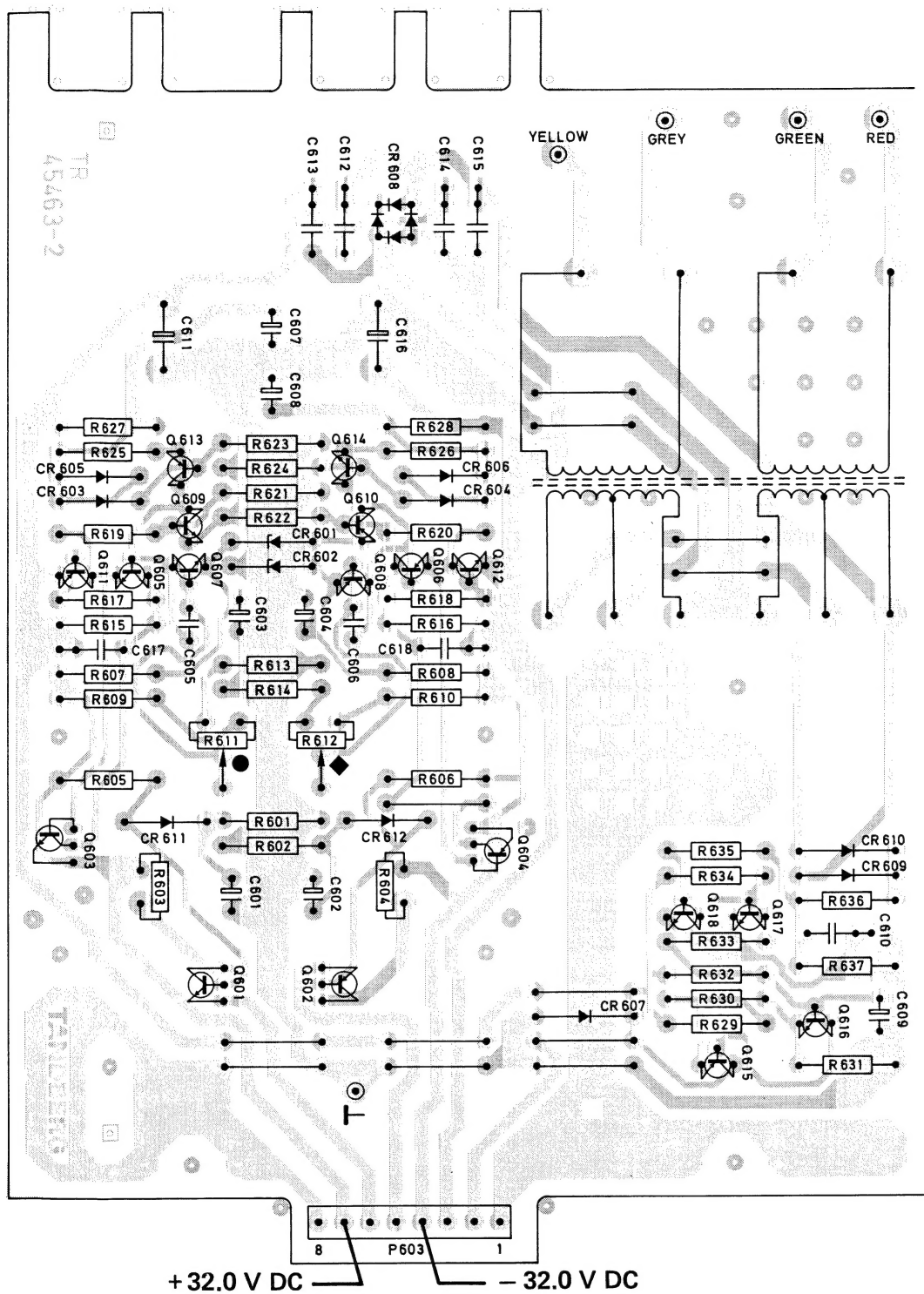


Figure 10 Power supply board

Adjusting the supply power (± 32 V)

- Adjust R611 for + 32.0 V at pin 7, J503 (Figure 10).
- ◆ Adjust R612 for - 32.0 V at pin 4, J503 (Figure 10).

Tandberg Control Amplifier TCA 3002

Technical data

Power requirements:	115/230 V \pm 10%, 50/60 Hz
Power consumption:	30 W max.
AC-outlets:	Unswitched 1
	Switched 3

Dimensions:	Width	17 1/8" (43.5 cm)
	Depth	13 3/4" (35.0 cm)
	Height	3 1/4" (8.3 cm)
	Weight	12.5 lbs (5,7 kg)

Technical Data according to IHF-A-202, 1978

Frequency response

Phono MM:	20 – 20,000 Hz	\pm 0.2 dB
Phono MC:	20 – 20,000 Hz	\pm 0.2 dB
Tape 1, Tape 2:	20 – 20,000 Hz	+ 0/– 0.1 dB
Tuner, AUX:	20 – 20,000 Hz	+ 0/– 0.1 dB

Maximum Voltage Output

Preamp output:	5 V at THD = 0.004%
Preamp output:	10 V at clipping level
Tape 1, Tape 2:	7.5 V
Headphone output:	20 V unloaded

Total Harmonic Distortion (20 Hz – 20,000 Hz)

Phono MM:	< 0.004%
Phono MC:	< 0.004%
Tape 1, Tape 2:	< 0.004%
Tuner, AUX:	< 0.004%

Input Sensitivity – Ref. 0.5 V output voltage

Phono MM:	1 mV
Phono MC:	80 μ V
Tape 1, Tape 2:	70 mV
Tuner, AUX:	70 mV

A-weighted Signal-to-Noise Ratio

Phono MM:	80 dB
Phono MC:	74 dB
Tape 1, Tape 2:	95 dB
Tuner, AUX:	95 dB

Maximum Input Voltage (1 kHz)

Phono MM:	290 mV
Phono MC:	22 mV
Tape 1, Tape 2:	11 V
Tuner, AUX:	11 V

Input Impedance

Phono MM:	33 / 47 / 100 kohms
Phono MC:	1 kohm
Tape 1, Tape 2:	47 kohms
Tuner, AUX:	47 kohms

Secondary Disclosures

Output Impedance

Preamp:	560 ohms + 10 μ F in series
Headphones:	470 ohms
Headphones (min. load):	4 ohms

Tone-control Response

Bass:	\pm 10 dB at 50 Hz
Treble:	\pm 10 dB at 10,000 Hz
Loudness:	Max. 7 dB at 50 Hz
	Max. 3 dB at 10,000 Hz

Filter

Sub Sonic:	– 12 dB/oct., – 3 dB at 15 Hz
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Crosstalk (100 Hz – 10 kHz)

Phono MM:	To any of the other sources > 70 dB
Phono MC:	To any of the other sources > 70 dB
Tape 1, Tape 2:	To any of the other sources > 70 dB
Tuner, AUX:	To any of the other sources > 70 dB

Separation (100 Hz – 10 kHz)

Phono MM:	> 53 dB
Phono MC:	> 53 dB
Tape 1, Tape 2:	> 58 dB
Tuner, AUX:	> 58 dB

Transient intermodulation

All inputs:	Immeasurable
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Other Technical Data

Frequency Response

Tape 1, Tape 2:	5 – 130,000 Hz, + 0/– 1.5 dB
Tuner, AUX:	5 – 130,000 Hz, + 0/– 1.5 dB

Phase shift (20 Hz – 20,000 Hz)

Tape 1, Tape 2:	+ 9.5°/– 2.5°
Tuner, AUX:	+ 9.5°/– 2.5°

- Specifications are subject to change for further improvement without notice.

Optional Extras

- Black acrylic side walls for freestanding units.
- Attachment sets for installation in 19 inch racks.

TANDBERG®
The European Alternative

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